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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/739,670	12/20/2000	Justin Thompson	A7876	3957

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EXAMINER

SOUW, BERNARD E

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 07/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/739,670

Applicant(s)

THOMPSON ET AL.

Examiner

Bernard E Souw

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-56 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5,7. 6) ☐ Other: _____

DETAILED ACTION

Claim Objection

1. Claim 1 is objected to for reciting the word "through" two times, one after another, "for curing an article passing through said apparatus through ultraviolet radiation". It is suggested to substitute the second "through" by the word "by", i.e., "for curing an article passing through said apparatus by ultraviolet radiation".

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eliasson et al. (USPAT # 4,837,484; hereafter addressed as Eliasson-484) in view of Rhoades (USPAT # 6,419,749; hereafter addressed as Rhoades-B1) and in further view of general knowledge in the art.

3. Regarding claims 1, 2, 24 and 25, Eliasson-484 discloses an apparatus for curing an article passing through said apparatus by ultraviolet radiation, as shown in Fig.3 and recited in Col.4/ll.44-61, comprising:

- a hollow tubular ultraviolet (UV) light emitting device (9-14) having an interior surface and an exterior surface;
- a UV-transparent tubular element 14 (or 9) defining a first space 16 for insertion of an article to be cured, the tubular element 14 (or 9) being surrounded by the UV light emitting device (9-14) defining a second space 12 between an interior surface (of tube 8) of the light emitting device and an outermost surface of the tubular element 14 or 9, as recited in Col.4/II.44-61; and
- means for passing an inert gas through the first space 16, as recited in the Abstract, lines 3-4 and implicated in Col.4/II.54-57.

In a second option, Eliasson-484's uses water or liquid electrolyte as discharge electrode 14, specifically recited in Col.4/II.58-61, which inherently needs an additional tubing to contain between tubing wall 9 and first space 16, here denoted as 14a (not shown, but is inherent in Eliasson-484).

- Specifically regarding claim 2, Eliasson-484's UV-emitting device is cylindrical, as is obvious in Fig.3 and in Col.4/II.44-61.
- Regarding claim 24, Eliasson-484 shows all the claim limitations, except the recitations of a dichroic reflector surrounding the light emitting device, the dichroic reflector reflecting only UV light.

Rhoades-B1 describes an apparatus for curing article inserted in it by UV irradiation, as illustrated in Fig. 2, 3 and 4. Rhoades-B1's apparatus comprises an article to be cured 8 inserted in a first space (equivalent to Eliasson-484's first space 16), i.e., inside tubular element 12 (equivalent to Eliasson's tubular element 9), having

its outer surface facing the UV radiation emitted by a UV lamp 2 shown in Fig.4) and a second space between the outer surface of Rhoades-B1's tubular elements 12 & 14 and the UV emitting device 2, wherein the inner tube 12 may be simply eliminated, as specifically recited by Rhoades-B1 in Col.3/ll.9-12. Rhoades-B1's tubular element 14 has a dichroic coating 20, thus forming a dichroic reflector.

However, Rhoades-B1's dichroic mirror 14+20 only reflects the infrared (IR) light but transmits the UV light from lamp 2 to keep the heat away from the article 8 to be cured, as taught in Col.2/ll.63-67 and Col.3/ll.1-6. One of ordinary skill in the art at the time the invention was made would have known that the choice of Rhoades-B1's dichroism is solely caused by the external location of light source 2 outside of tubular elements 12 and 14, the latter being the equivalent of Eliasson-484's tube/electrode 8. While this is just the opposite of what is recited in Applicant's claim, it would have been also obvious to one of ordinary skill in the art, that, in case the UV light source is located inside of Rhoades-B1's tubular element 14, as in Eliasson-484's apparatus, with the UV light source located inside of tube 8 (Fig.3), the dichroism should be just the opposite of Rhoades-B1's, i.e., reflecting only UV light to retain it, but transmitting IR light to release the latter from the apparatus.

It would have been therefore obvious to one of ordinary skill in the art at the time the invention was made to substitute Eliasson-484's metal tube 8 with a transparent electrode as taught by Rhoades-B1, thereby applying Rhoades-B1's dichroic coating to the inside surface of Eliasson-484's tube 10' shown in Fig.3, since the two prior arts

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have their UV light source at different positions relative to the tube wall 8, so the dichroism to be applied should be chosen correspondingly.

The examiner recognizes that obviousness is here established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In the present case, the Rhoades-B1 teaching of using dichroic mirror is modified by Eliasson-484 apparatus, in which the UV light source is inside the tubular elements 12 & 14, instead of outside, as in Rhoades-B1's. The rationale to modify the prior art of Rhoades-B1 by Eliasson-484 is reasoned from knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

This relates to suggestion/motivation in that "having established that this knowledge was in the art, the Examiner could then properly rely on a conclusion of obviousness 'from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference'." *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969).

● Regarding claim 25, a means for passing an inert gas through the first space is recited by Eliasson-484 (see claim 1 above) as well as by Rhoades-B1 in Col.3/II.24-26.

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4. Regarding claims 10, 30, 43 and 46, the limitation of a means for flowing a first cooling medium through the second space, i.e., Eliasson-484's second space 12 between the interior surface of 8 and the outermost surface of the tubular element 14 or 9, is rendered obvious by Eliasson-484 in Col.4/ll.34-38

● Specifically regarding claim 46, the limitation of "cooling the first cooling medium", is totally trivial, and hence, principally unpatentable.

5. Regarding claims 7-9, 27, 28 and 48-50, the limitation that the tubular element is coated with a shielding layer that is substantially transparent to UV light and reflective to IR light is rendered obvious by Rhoades-B1's tubular elements 12 & 14 (wherein the inner tube 12 may be simply eliminated, as specifically recited by Rhoades-B1 in Col.3/ll.9-12), wherein Rhoades-B1's tubular element 14 has a dichroic coating 20 that is transparent to UV light but reflective to the IR light, as recited in the Abstract, lines 3-8, in Col.2/ll.63-67 and in Col.3/ll.1-8.

6. Regarding claims 11, 31 and 45, the limitation that the first cooling medium is transparent to UV radiation is rendered obvious by Eliasson-484, as recited in Col.4/ll.34-38 & 58-62, whereby water is known in the art as being UV transparent.

7. Regarding claims 12, 13, 32 and 33, the limitation that the first cooling medium is either a gas or a liquid, is rendered obvious by Eliasson-484, as recited in Col.4/ll.22-23 & 34-38.

8. Regarding claims 14, 15, 34, 47 and 51, the limitation of a means to flow the second cooling medium past the exterior surface of the UV emitting device (with a dichroic reflector as modified by Rhoades-B1 described above), is rendered obvious by Eliasson-484, as recited in Col.4/ll.48-51.
9. Regarding claims 17 and 36, the second cooling medium is not necessarily water, as already implicated by Eliasson-484 in Col.4/ll.50-51, but may be also gaseous, as recited in Col.4/ll.22-23.
10. Regarding claims 18 and 37, a third space defined between the dichroic mirror and the tubular UV light source is rendered obvious by Eliasson-484 modified by Rhoades-B1's dichroic coating as being the space between Eliasson-484's electrode 8 (modified by Rhoades-B1 into a transparent wall), and Eliasson-484's outer tube 10' shown in Fig.3, as recited in Col.4/ll.48-51. The limitation is also rendered obvious by Rhoades-B1 as modified by Eliasson-484, as being the (wide) space between the surface of 14 (with coating 20) and the UV lamp 2 as shown in fig.4.
11. Regarding claims 19, 38 and 53, the limitation of a means for passing a second cooling medium through the third space of claims 18 and 37 is rendered obvious by Eliasson-484 as recited in Col.4/ll.48-51.

12. Regarding claims 20 and 39, the second cooling medium can be either gas or liquid, as also is the case with the first cooling medium in claims 12, 13, 32 and 33 above,

13. Regarding claims 3 and 29, the limitation that the tubular element is removably connected to be easily removed and replaced, is a mere matter of design choice that has no impact whatsoever on the proper functioning of the apparatus, while requiring only routine skill in the art, and is therefore unpatentable.

14. Regarding claims 4-6, 26 and 44, the limitation of a means to heat or to cool the inert gas passing through the first space, is a mere matter of design choice that is conventional and well known in the art, while requiring only routine skill in the art, and is therefore unpatentable.

15. Regarding claims 21-23, 40-42 and 54-56, the limitation that some of the UV radiation contacts the article to be cured, prior, or after, or both prior and after, the article enters or exits the tubular UV light source, is a mere matter of design choice that does not have any impact on the proper functioning of the apparatus, while requiring only routine skill in the art, and is therefore unpatentable.

16. Regarding claims 16, 35 and 52, the limitation that the dichroic mirror has a plurality of apertures for allowing the second medium to contact the exterior surface of

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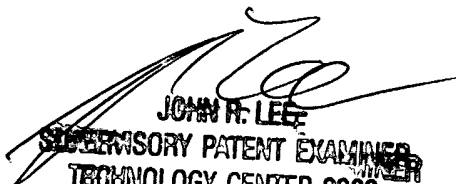
the UV emitting device, is a mere matter of design choice that is not critical for the proper functioning of the apparatus, while requiring only routine skill in the art, and is therefore unpatentable.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 703 305 0149. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes
June 24, 2003


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
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